US Army Corps
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Hydrologic Engineering Center

Hydrologic Modeling System HEC-HMS

Known Bugs

Version 3.0.0 Beta
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Introduction

The Hydrologic Modeling System (HEC-HMS) software development team makes every effort to produce quality software. Extensive testing is performed to make sure features in the program interface operate as intended. Benchmarks have been developed to rigorously test the simulation features and compare computed results to independent calculations. In spite of extensive testing, it is still possible for bugs to escape our notice.

Highest priority for repairing bugs is given to those problems that cause incorrect results to be displayed, that corrupt input data, or cause the program to stop working. Moderate priority is given to bugs that make the program difficult to use or have no work-around. Lowest priority is given to bugs that are only annoying or rarely encountered. Generally speaking, highest priority and moderate priority bugs are receiving active work to isolate and repair them. Lowest priority bugs are typically inactive until the higher priority work is finished. This document attempts to describe all bugs currently known to the development team. Any user who discovers a bug not on this list should forward a description to the development team through the HEC website.

Active Work Items

Accessing Optimization Results

Results from computing an optimization trial may not be available when they should be, or may be available when they should not. Changes in the basin model used in the trial are not considered appropriately when determining if computed results should be available.

Work around: none, except to restart the program.

Status: active.

Secondary Y-Axis Label

The basin element graph accessed from the basin map may include stage. The y-axis labeling for this time-series is on the secondary axis on the right side of the graph. Because of problems with significant digits, the scale does not have regular intervals and shows the first value as "-0.00".

Work around: none, but the computed results are internally correct.

Status: active.

Importing HEC-1 Projects

In some instances, the program will stop working when importing an HEC-1 project. So far, this only occurs when importing very large projects with more than 100 basin model elements.

Work around: divide the HEC-1 project into multiple files and import them separately. Then, combine the separate basin models.

Status: active.

Temperature Time-Series Gage Elevation Parameter

An elevation can be specified for a temperature time-series gage. This is required when using the gage in a simulation where the temperature index snowmelt method is used. No units are shown for elevation if the temperature time-series gage is set up to use an external DSS file. Also, the elevation value is changed by the program.

Work around: None.

Status: active.

Snowmelt

The snowmelt method is currently undergoing testing. Unknown bugs could be present in the user interface and the computation engine.

Work around: be careful when using the snowmelt method.

Version: active.

Future Work Items

Subbasin Precipitation Results

Subbasin element results (time-series table, summary table, and graph) show precipitation. This is fine as long as snowmelt is not used. When snowmelt is used, the liquid water available at the soil surface (LWASS) should be shown instead of the precipitation, since in general they are not equal.

Work around: none, but the precipitation as the sum of rain and snow is correct. LWASS and other snowmelt results, like snow water equivalent (SWE), are available from the Results tab of the watershed explorer.

Status: inactive.

Select Current Simulation Run

In a project with many simulation runs, a run may not be able to be selected from the Compute menu. There are so many runs that they do not all fit on the menu used to select a run. The runs that do not fit are left off of the menu. The same would apply to optimization trials and depth-area analyses.

Work around: open the Compute tab of the watershed explorer to select a run.

Status: inactive, no available alternative.

Memory Usage

Results for up to four simulation runs are saved in memory. Results should be removed from memory when opening another project; currently, they are not. Memory usage does not decrease when opening a different project. This is a minor impact except on very large projects.

Work around: none, except to restart the program.

Status: inactive.

Optimization Trial and Depth-Area Analysis Editors

Editors for optimization trials and depth-area analyses contain drop-down menus for selecting basin elements and basin element parameters. Currently, the drop-down menus do not update based on previously selected basin elements or parameters. It would be useful to update the lists by removing items that are already selected.

Work around: be careful to not select the same basin element or parameter from optimization trial and depth-area analysis editors.

Status: inactive.

Line Through Title Bar

A line will show up on the title bar of windows, like the basin model map, that are completely expanded in the desktop if the computer's display properties are set to "Windows XP Style."

Work around: none.

Status: inactive, beyond control of development team.

Time-Series Results Table

Multiple time-series results are graphed in the unit system of the result type selected first from the results tab of the watershed explorer. However, when results are viewed in a time-series table, each time series is shown in its own unit system. It would be beneficial to also display results in time-series tables using the same unit system as the result type selected first.

Work around: none, but results are correct as shown.

Status: inactive, no available alternative.

Kinematic Wave Loss Results

Excess precipitation and direct runoff shown in the subbasin summary and time-series tables are the area-weighted average of both planes. It would be nice to see excess precipitation and loss separately for each plane.

Status: inactive.

Added Functionality for Managing Multiple Components

Additional functionality is needed for the watershed explorer and component managers to manage (delete, copy, move, etc.) multiple components at one time. For example, it would save time if multiple precipitation gages could be deleted at once instead of deleting only one gage at a time.

Work around: manage only one component at a time.

Status: inactive.

Project Manager

Currently, only the opened projected can be deleted, renamed, or moved to another directory. A project manager is needed to manage all HEC-HMS projects, opened or closed.

Work around: open a project to manage it.

Status: inactive.

Available Optimization Parameters

When developing an optimization trial, parameters are chosen from basin model elements located upstream of elements containing observed/measured stream flow. These parameters are adjusted during the optimization trial to reduce differences in simulated and observed hydrographs. Parameters for the kinematic wave routing and transform methods are not available for an optimization trial. Also, loss method parameters for the second overland flow plane, only required when using the kinematic wave transform method, are not available.

Work around: none.

Status: inactive.

DSS Pathname Drop-Down Menus

Time-series data and paired data can be entered manually or referenced to an existing record in a DSS file. Gridded data can not be entered manually and must reference a record in a DSS file. When selecting external records in a DSS file, a window opens that helps the user find the correct record. The window has drop-down menus for each pathname part (a-f). When a pathname part is selected in one of the drop-down menus, the list of available records is reduced to only show those records with the selected pathname part(s). However, the lists of available pathname parts, from the drop-down menus, are not updated.

Work around: none.

Status: inactive.

Parameter Precision

When input data is entered by the user, the program should display the value using the precision entered by the user. If a value of 4.0 is entered, then the program should display 4.0. Parameter precision is automatically changed in paired data tables, time-series data tables, and the frequency storm component editor.

Work around: none.

Status: inactive.

External Paired Data Table

A paired data table can be entered manually or referenced to an existing record in a DSS file. Currently, no data will show up in the table or graph tabs of the paired data editor after an external record is selected from a DSS file.

Work around: data will be visible from the table and graph tabs after the program is restarted.

Status: inactive, not consistently reproducible in a test case.

Time-Series Gage Time Interval

The program will stop working after the following steps: 1) change the Data Source option from DSS to Manual Entry for a time-series gage, 2) change the Time Interval (select a different time interval than the one already selected), and 3) expand the watershed explorer for the gage and select the time window node.

Work around: none.

Status: inactive.

Project Defaults

Project defaults, like unit system, loss method, transform method, precipitation method, etc, are set by selecting the Tools→Options menu item and clicking the Defaults tab. Predefined project defaults are already set when a project is created. The defaults are used when a new component is added to the project. For example, when a subbasin element is added to the project, the initial loss, transform, and baseflow methods are set to the methods defined by the project defaults. Currently, these defaults are only valid for the project in which they are set. If a new project is created, then the defaults revert to a predefined set of defaults. It would be nice if the predefined defaults would update based on user preference.

Work around: none.

Status: inactive.

Basin Map Extents 2

Basin map extents are automatically set to the maximum extents when a basin map opens in the desktop. It would be nice if the last extents viewed by the user were used when a basin map opened.

Work around: none.

Status: inactive.

Basin Map Extents 1

The zoom out and pan tools for the basin map will not expand beyond the maximum extents. It would be nice if the tools could move a limited amount past the maximum extents.

Work around: increase the maximum extents.

Status: inactive.

Fixed Work Items

Reservoir Error Message

The error message generated when the storage-outflow, elevation-storage, elevation-area, or elevation-discharge curve is exceeded is not very helpful. It lists the independent variable and maximum table value in metric units but no units are included in the message. A similarly unhelpful message is generated when the independent variable falls below the first value in the table.

Work around: extend the storage-outflow, elevation-storage, elevation-area, or elevation-discharge table to cover the full range of storage or elevation values that may occur in the reservoir during the compute.

Version: Beta 2.

Reservoir Initial Condition Error Message

The error message generated when the initial condition is below the first value in the storage-outflow, elevation-storage, elevation-area, or elevation-discharge curve is not very helpful. The initial condition is listed as being invalid, when it should be stated as below the minimum table value.

Work around: extend the storage-outflow, elevation-storage, elevation-area, or elevation-discharge table to cover the full range of initial conditions.

Version: Beta 2.

Tab Selection After Adding New Gage

When a time-series gage is created in the project, a default time window is also created, and the time window tab is automatically selected. In order to specify gage properties such as units or interval, you must return to the main gage editor tab. When creating a new gage, the main gage editor tab should be selected instead of the default time window tab since this better reflects normal work flow.

Work around: click on the main gage editor tab to change properties.

Version: Beta 2.

Comment: The time window tab is not automatically selected when a time-series gage is added to the project. Focus is no longer shifted automatically by the program after a change is made by the user. The user must select model components, basin models, time-series gages, etc. after adding them to the project or editing them.

Optimization and Analysis Compute Messages

A message is generated when a simulation run, optimization trial, or depth-area analysis begins computing. The message always states a simulation "run" began computing instead of correctly identifying the type of compute. The messages for an optimization trial and a depth-area analysis should correctly identify the type of compute.

Work around: none.

Version: Beta 2.

Print Range

A Print window opens when the Print Current Selection button is pressed. The print range shows "from: 1 to: 9999" when printing a graph. This only happens when printing a graph; not for any other item.

Work around: none, but only one page is printed.

Version: Beta 2.

Paired Data Table

If a paired data table is copied before any values in the table have been saved, then the unsaved values will not be copied to the new table.

Work around: before making a copy of a paired data table, make sure the project has been saved if new values were entered into the table.

Version: Beta 2.

Comment: Also repaired for all other components in watershed explorer.

Bounded Recession Baseflow

The bounded recession baseflow method does not correctly calculate baseflow. The initial baseflow is correct, but it stays constant during the compute. No recession is computed.

Work around: do not use this method.

Version: Beta 2.

SCS Transform Message

Depending on the SCS lag time parameter value and the computation time step, a message is generated stating that the ordinates of the unit graph are truncated from ## to ##. This is a confusing message and should be removed.

Work around: none, but validation tests do confirm that results from the SCS transform method are correct.

Version: Beta 2.

Additional Result Types

Additional result types need to be available from the user interface for subbasin elements using the Deficit/Constant and SMA loss methods. It would be beneficial to view results of moisture deficit, evapotranspiration, soil storage, etc.

Work around: additional results are written to the project DSS file and can be viewed using HEC-DSSVue.

Version: Beta 2.

Opening Projects

Occasionally, a time-series gage will be selected automatically when opening a project. Normally, no component would be selected automatically when a project is opened.

Work around: none.

Version: Beta 2.

Duplicate Messages When Stopping an Optimization Trial

A window with a progress bar opens during the compute of a simulation run, optimization trial, or depth-area analysis. Duplicate messages appear in the message window when manually stopping the compute of an optimization trial set up to use the univariate gradient search method. Also, one of the messages shows an unreasonable value for the objective function.

Work around: none, but the compute does stop correctly.

Version: Beta 2.

Control-V

The **Control-V** option, useful for pasting data from the clipboard into an input field or table, does not work. The **Control-C** option does work and will copy data from an input field and table to the clip board.

Work around: there is a right mouse menu that contains the "paste" option.

Version: Beta 2.

Comment: Cut, copy, and paste should work correctly from the Edit menu, the short-cut keys, and right-mouse context menus.

Parameter Precision Kinematic Wave Transform Editors

When input data is entered by the user, the program should display the value using the precision entered by the user. If a value of 4.0 is entered, then the program should display 4.0. Parameter precision is automatically changed in the kinematic wave transform component editors (plane, collector, and main channel editors).

Work around: none.

Version: Beta 2.

Date and Time Format

The correct format for entering date and time information is displayed in editors where this information is required. For dates, the correct format is "ddMMMYYYY," where "d" represents day, "M" represents month, and "Y" represents year. The correct format for time is "HH:mm," where "H" represents hour and "m" represents minute. The colon is required when entering a time. Currently, the program will stop working if only two-digits are entered for the year.

Work around: include all four digits for the year when entering dates.

Version: Beta 2.

Copying a Meteorologic Model that uses Gridded Snowmelt

Meteorologic models can be copied using the right mouse menu in the watershed explorer or using the Meteorology Manager. The program will stop working when copying a meteorologic model using the gridded snowmelt method.

Work around: do not copy a meteorologic model using the gridded snowmelt method.

Version: Beta 2.

Unable to Create Optimization Trial

Even though the optimization trial wizard will begin the process of creating a trial, the trial cannot be created. The optimizer folder is deleted before the trial is created.

Work around: none.

Version: Beta 2.

Computed Results Unavailable

A run must be computed twice before results are available if one or more elements use observed flow. Only appears to happen from the time a gage is created until the project is closed: does not happen after the project is reopened or the program is restarted.

Work around: Compute run a second time.

Version: Beta 2.

Computing Results from Watershed Explorer

Results are not available after computing a simulation run using the right mouse menu from the watershed explorer. This applies to results accessed from the watershed explorer, basin map, or menu system.

Work around: Compute simulation run from the menu.

Version: Beta 2.

Copying a Paired Data Table

A paired data table can not be copied. A command window was opened using the HEC-HMS.cmd file in the program directory (default location C:\Program Files\Hec\HEC-HMS\3.0.0 Beta 1). The error messages in the command window show a NoSuchMethodException had occurred.

Work around: None.

Version: Beta 2.

Time-Series Gages and Unit Hydrograph Time Interval

No time interval is set for a time-series gage when it is first created. Because of this, the table for the default time window contains no rows. Selecting an interval on the time-series gage editor leads to unpredictable behavior and erroneous data conversion.

Work around: None.

Version: Beta 2.

Subbasin Elements in Meteorologic Models

Once a basin model is specified for a meteorologic model, the subbasin elements in the basin model fill the watershed explorer. This occurs for certain meteorologic model methods, like gage weights and inverse distance. In some cases, duplicate subbasin elements are added to the watershed explorer.

Work around: None.

Version: Beta 2.

Renaming Projects

While renaming a project, incorrect error messages may be generated about failure to copy or delete certain project files. The analysis configuration file is not moved at all. If the project contains a large number of files, it may be possible for another copy of the program to open the project half way through the rename process.

Work around: None.

Version: Beta 2.

Changing the Time Window for an Irregular Interval Time-Series Gage

The program will not accept changes to the time window for a time-series gage using an external DSS record which has an irregular time interval.

Work around: none.

Version: Beta 2.

Time-Series Gage Units

Units for a time-series gage are shown in the Table and Graph editors. The wrong units are displayed if an external DSS record is selected and the time window is set so that no data exists in the DSS record for the time window.

Work around: none.

Version: Beta 2.

Kinematic Wave Transform and the Second Loss Editor

A second loss editor is added to the subbasin element component editor when the kinematic wave transform method is selected. Initially, the second loss editor is not active. This editor should become active once a percent area is specified for the second overland flow plane.

Work around: none.

Version: Beta 2.

Snowmelt

Both snowmelt methods are currently undergoing testing. Unknown bugs could be present in the user interface and the computation engine.

Work around: be careful when using the snowmelt methods.

Version: Beta 2.

Comments: Many bugs involving snowmelt have been fixed. These include: the elevation band editor correctly saves data, an elevation band editor is correctly deleted from the project, the program can copy a meteorologic model using the "elevation band" temperature index method, temperature time-series data is correctly converted between unit systems, the lapse rate parameter is correctly converted between unit systems, the cold rate parameter is correctly converted between unit systems, valid minimum and maximum values were updated for snowmelt parameters (now, it is possible to enter an initial SWE greater than 100 mm).

Hydrologic Elements Not Drawing in the Basin Map

Hydrologic elements (subbasin, reach, junction, etc.) are added to a basin model by selecting the element from the toolbar and clicking in the basin map. In some instances, the hydrologic element is not visible in the map after it was added, however, it is visible in the watershed explorer.

Work around: Use the Arrow Tool  and click anywhere in the basin map. All hydrologic elements should become visible.

Version: Beta 2.

Saving Unit Hydrograph Data

A unit hydrograph (user specified unit hydrograph) is included as a paired data type. Data for a manual entry unit hydrograph is entered on the Table tab in the unit hydrograph component editor. Data entered by the user is not being saved to the project DSS file.

Work around: none

Version: Beta 2.

Printing the Basin Model Schematic

The basin model schematic does not print correctly. The Print Current Selection button should print a copy of the basin model schematic opened in the desktop.

Work around: none.

Version: Beta 2.

Annual Pattern Graphs

Annual pattern graphs are not drawn correctly. The point values are drawn correctly, but lines should be drawn connecting the point values.

Work around: none.

Version: Beta 3.

Axis Scales for Optimization

One of the output graphs for an optimization trial includes a flow comparison graph. This graph compares simulated and observed hydrographs. It would be more appropriate to display this graph using the same scale for both the X and Y axis.

Work around: none.

Version: Beta 3.

Time-Series Gage Time Window

The program will stop working after selecting a time window in the watershed explorer if the time window includes a starting or ending date occurring when daylight saving time is observed.

Work around: none.

Version: Beta 3.

No Units for Elevation Band Editor

No units are shown in the temperature index elevation band editor.

Work around: none.

Version: Beta 3.

Optimization and Renaming Basin Model Elements

Basin elements must be specified for an optimization trial. Element parameters are adjusted during an optimization trial to reduce differences between simulated and observed hydrographs. Basin element names are not correctly updated in the optimization trial after they are modified in the watershed explorer.

Work around: manually update optimization trials after renaming basin model elements.

Version: Beta 3.

Optimization Parameter

The optimization trial parameter editor lets you select a basin element and a parameter to adjust during optimization. For some parameters, the program does not save the selected parameter. The "None Selected" option is automatically selected by the program even though a parameter was chosen.

Work around: none.

Version: Beta 3.

Result Availability when Using a Snowmelt Method

Results should be available from the basin model map or the Results tab of the watershed explorer after a simulation run is computed. Currently, results are not available after a simulation run has been computed if the meteorologic model uses the temperature index or gridded temperature index snowmelt methods.

Work around: after the simulation run has been successfully computed, close and reopen the program. Results should be available from the Results tab.

Version: Beta 3.

Zoom to Selected

When basin elements are selected, the View→Zoom to Selected menu option becomes active. This menu option does not consistently work correctly when it is selected.

Work around: none.

Version: Beta 3.

Basin Map Extents 3

Some basin model elements and maps are not fully visible in the basin map after the maximum extents are set. A larger buffer in needed so that all basin model elements and maps are visible after setting the maximum extents.

Work around: after setting the maximum extents, use the zoom out option from the View menu.

Version: Beta 3.

Comment: An option to let the user specify a buffer was added to the maximum extents editor. This option is available when the "Union of all Elements" or the "Union of all Maps and Elements" option is selected in the method menu.